

WHAT IS CLAIMED IS:

1. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising a correction and control means for correcting an input signal from said air flow rate detection means and controlling said throttle means.

2. An integrated air flow sensor according to claim 1, wherein said correction and control means makes said correction based on said reduction amount.

3. An integrated air flow sensor according to claim 1, wherein said correction and control means controls said throttle means so that the value of the signal after said correction is made may approach the target value.

4. An integrated air flow sensor according to claim 1, wherein said correction and control means calculates a second air flow rate based on the engine speed and said reduction amount, and outputs a specific signal when the difference between the signal value after said correction and the second air flow rate is more than the fixed value.

5. An integrated air flow sensor according to claim 1, wherein said correction and control means calculates a second air flow rate based on the engine speed and said reduction amount, and outputs said second air flow rate signal when the

difference between the signal value after said correction and the second air flow rate is more than the fixed value.

6. An integrated air flow sensor according to claim 1, wherein said correction and control means calculates a second air flow rate based on the engine speed and said reduction amount and outputs it, when said reduction amount is below the fixed value.

7. An integrated air flow sensor according to any one of claims 4, 5 and 6, wherein said correction and control means corrects said second air flow rate based on the input air temperature.

8. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising a pressure calculation means for calculating the pressure from the air flow rate detected by said air flow rate detection means, the engine speed, the reduction amount by said throttle means and the air temperature.

9. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body,

said air flow rate detection means and said throttle means being integrated;

further comprising a air flow rate calculation means for calculating the corrected air flow rate from the air flow rate detected by said air flow rate detection means, the engine speed, the reduction amount by said throttle means and the air temperature.

10. An integrated air flow sensor according to any one of claims 4, 5, 6, 8 and 9, wherein said engine speed is detected based on the change in the value of the air flow rate signal detected in said air flow rate detection means.

11. An integrated air flow sensor according to any one of claims 1, 8 and 9, further comprising a thermosensitive resistor exposed to said air flow,

wherein said air temperature is calculated by using an electric current which flows in said thermosensitive resistor or a voltage applied to both ends of said thermosensitive resistor.

12. An integrated air flow sensor according to any one of claims 1, 8 and 9, wherein said air flow rate detection means detects the air flow rate based on the amount of heat radiation from the resistor which generates heat, said throttle means is an electronically controlled throttle, and said correction and control means is an electric circuit provided with the microcomputer.

13. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage,

and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising an air flow rate calculation means for calculating the filtered air flow rate when the change speed in the reduction amount by said throttle means is less than a certain fixed value.

14. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising an air flow rate calculation means for calculating the corrected air flow rate when the change speed in the reduction amount by said throttle means is more than a certain fixed value.

15. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising two or more correction maps, and an air flow rate calculation means for calculating the air flow rate by using the correction map selected from said plural maps by an external signal.

16. An integrated air flow sensor according to claim 15, wherein the selection of the correction map is carried out once for all.

17. An integrated air flow sensor according to claim 15, wherein the selection of the correction map is able to change only when a specific condition is satisfied.

18. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising a circuit which can perform the detection of said air flow rate and the control of said throttle means together.

19. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, and a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, said body, said air flow rate detection means and said throttle means being integrated;

further comprising a correction and control means for performing the correction of signals from said air flow rate detection means and pressure detection means and the control of said throttle means.

20. An integrated air flow sensor according to claim 19, wherein said correction and control means corrects the signal from said pressure detection means based on said reduction amount.

21. An integrated air flow sensor according to claim 19, wherein said correction and control means controls said throttle means so that the signal of said pressure detection means may be made to approach the target value.

22. An integrated air flow sensor according to claim 19, wherein said correction and control means calculates a second air flow rate based on the engine speed and said reduction amount, calculates a third air flow rate based on the engine speed and the detection value of said pressure detection means, compares the first flow rate by said flow detection means, said second air flow rate and said third air flow rate, and outputs a specific signal when any one of values is different by more than the fixed value.

23. An integrated air flow sensor according to claim 19, wherein said correction and control means calculates a second air flow rate based on the engine speed and said reduction amount, calculates a third air flow rate based on the engine speed and the detection value of said pressure detection means, compares the first flow rate by said flow detection means, said second air flow rate and said third air flow rate, and outputs said second or third air flow rate signal when the difference between said first air flow rate and other air flow rate is more than the fixed value.

24. An integrated air flow sensor according to claim 19, wherein said correction and control means calculates a second air flow rate based on the engine speed and said reduction amount, calculates a third air flow rate based on the engine speed and the detection value of said pressure detection means, compares the first flow rate by said flow detection means, said second air flow rate and said third air flow rate, and performs the correction of displacement of the air flow rate, fault diagnosis, or the determination of the optimum air flow rate when the measurement values of any one of said first to third air flow rate measurement devices is different by more than the fixed value.

25. An integrated air flow sensor according to claim 19, wherein said correction and control means calculates a third air flow rate based on the engine speed and said pressure detection means and outputs it, when said reduction amount is below the fixed value.

26. An integrated air flow sensor according to any one of claim 22, 23, 24 and 25, wherein said correction and control means corrects said second and said third air flow rate based on the input air temperature.

27. An integrated air flow sensor comprising:
a body forming air passage, an air flow rate detection means for detecting the air flow rate which flows in said air passage, a throttle means controlled with an electric signal, for limiting said air flow rate by reducing the flow, and a pressure detection means for detecting the pressure at the downstream of said throttle means, said body, said air flow rate detection

means, said throttle means and said pressure detection means being integrated;

further comprising an air flow rate calculation means for calculating the corrected air flow rate pressure from the air flow rate detected by said air flow rate detection means, the pressure detection means for detecting the pressure at the downstream of said throttle means, the engine speed, the reduction amount by said throttle means and the air temperature.

28. An integrated air flow sensor according to any one of claims 22 to 27, wherein said engine speed is detected based on the change in the value of the air flow rate signal detected in said air flow rate detection means.

29. An integrated air flow sensor according to any one of claims 22 to 27, wherein said engine speed is detected based on the change in the value of the pressure signal detected in said pressure detection means.

30. An integrated air flow sensor according to claim 26 or 27, wherein said air temperature is calculated by using an electric current which flows in said thermosensitive resistor or a voltage applied to both ends of said thermosensitive resistor.

31. An integrated air flow sensor according to any one of claims 19 to 30, wherein said air flow rate detection means detects the air flow rate based on the amount of heat radiation from the resistor which generates heat, said throttle means is an electronically controlled throttle, said pressure detection means is a semiconductor type pressure detection device and

said correction and control means is an electric circuit provided with the microcomputer.

32. An engine control system comprising:

the integrated air flow sensor according to any one of claims 1 to 31, and an engine control means for inputting a signal from said integrated air flow sensor, and controlling the amount of fuel supplied to an engine based on said signal.